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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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24309	7590	08/27/2007		
XILINX, INC ATTN: LEGAL DEPARTMENT 2100 LOGIC DR SAN JOSE, CA 95124			EXAMINER DIAZ, JOSE R	
			ART UNIT 2815	PAPER NUMBER
			MAIL DATE 08/27/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

TH

**Office Action Summary**

Application No.

10/796,471

Applicant(s)

ZHANG, LEILEI

Examiner

José R. Díaz

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 June 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 22-30 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 32 is/are allowed.
- 6) ☒ Claim(s) 1-21 and 31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 June 2007 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

1. The drawings as filed on June 4, 2007 are objected to under 37 CFR 1.83(a) because they fail to show the section line A-A' in figure 2B and the reference sign 35 in figure 2A as described in the amended specification as filed on December 18, 2006. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 31 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 31 recites the limitation "the package lid" in line 2. There is insufficient antecedent basis for this limitation in the claim.

5. In addition, the limitations as recited in claim 31 will be treated under 35 U.S.C. 112, sixth paragraph. It is noted the corresponding structure as recited in line 2 of claim 31 is unclear since applicant fails to particularly point out what structure will perform the recited function. Clarification is required.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

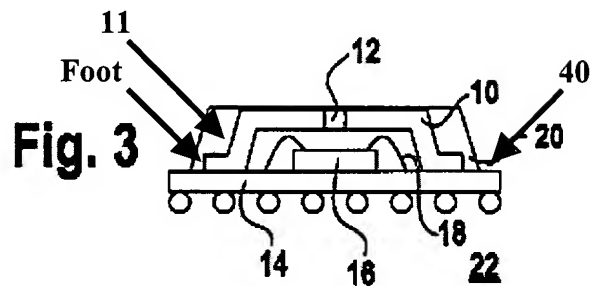
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. As far as understood, claims 1, 3-5, 7-10, 15, 19, and 21 remain rejected under 35 U.S.C. 102(a,e) as being anticipated by Fishley et al. (US Pat. No. 6,654,248 B1).

Regarding claim 1, Fishley et al. teaches a package lid for attaching to a package substrate of a packaged semiconductor comprising a sloped wall (11) configured to provide an exposed perimeter portion (40) of the package substrate (14) [see fig. 3, attached below]. With regards to the limitation that the sloped wall is used or configured to provide an exposed perimeter portion when the package lid is disposed on the package substrate, the court has held that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. See *In re Pearson* 181 USPQ 641 (CCPA 1974) and *In re Swinehart* 169 USPQ 226 (CCPA 1971). In the instance case, Fishley et al. teaches a sloped wall (11) configured to provide an exposed perimeter portion (40) of the package substrate (14) when the package lid (10) is disposed on the package substrate (14) to allow application of a molding compound (20) on the exposed perimeter portion (40) of the package substrate (14), the molding compound (20) contacting the sloped wall (11) to secure the package lid (10) to the package substrate (14) of the packaged semiconductor (22) [see fig. 3, attached below]. Thus, Fishley et al. anticipates the claimed invention since the prior art structure is capable of performing the claimed intended use.



Regarding claim 3, Fishley et al. teaches a foot ("foot") around at least a portion of the perimeter of the sloped wall (11), configured to contact the package substrate (14) when the package lid (10) is placed on the package substrate (14) [see figs. 1 and 3].

Regarding claim 4, Fishley et al. teaches the package lid (10) is a stamped package lid [please note that the lid was stamped or cut out to form opening 12. See fig. 3].

Regarding claims 5 and 7, Fishley et al. teaches a thickness of 0.5 mm [see col. 4, lines 1-3].

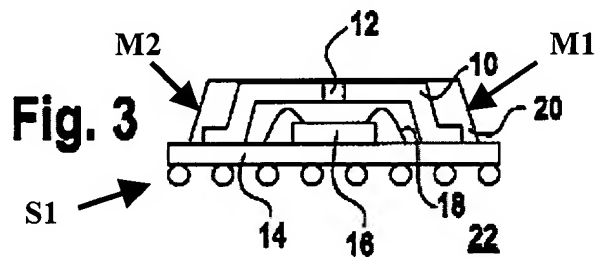
Regarding claim 8, Fishley et al. further teaches that the package lid comprises nickel-plated copper [see col. 4, lines 4-5].

Regarding claim 9, Fishley et al. further teaches a vent (12).

Regarding claim 10, Fishley et al. further teaches a vent (12) provided on the top side of the package lid (10) [see fig. 3].

Regarding claim 15, Fishley et al. further teaches that the package lid (10) is substantially rectangular [see fig. 1].

Regarding claim 19, Fishley et al. further teaches that the package lid (10) is disposed on the package substrate (14) to provide the exposed perimeter portion and further comprising: first molding compound (M1) applied to a first portion of the exposed perimeter portion (portion of substrate 14 covered with first molding compound M1) and contacting the sloped sidewall (11) [see fig. 3, below], and second molding compound (M2) applied to a second portion of the exposed perimeter portion (portion of substrate 14 covered with first molding compound M2) and contacting the sloped sidewall (11), wherein the first portion of the exposed perimeter portion is opposite the second portion of the exposed perimeter portion [see fig. 3, below].



Regarding claim 21, Fishley et al. teaches the package substrate includes a solder ball-grid array (S1) for connecting the packaged semiconductor to a printed circuit assembly [see fig. 3, above].

8. Claims 1, 3, 9-15, 19 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Tang et al. (US 6,246,115 B1).

Regarding claim 1, Tang et al. teaches a package lid for attaching to a package substrate of a packaged semiconductor comprising a sloped wall (321) [see figures 1

and 2] With regards to the limitation that the sloped wall is used or configured to provide an exposed perimeter portion when the package lid is disposed on the package substrate, the court has held that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. See *In re Pearson* 181 USPQ 641 (CCPA 1974) and *In re Swinehart* 169 USPQ 226 (CCPA 1971). In the instance case, Tang et al. teaches a sloped wall (321) configured to provide an exposed perimeter portion (area not covered with molding 33) of the package substrate (30) [see figs. 1 and 2]. Thus, Tang et al. anticipates the claimed invention since the prior art structure is capable of performing the claimed intended use.

Regarding claim 3, Tang et al. teaches a foot (321c) around at least a portion of the perimeter of the slope wall (321)

Regarding claim 9, Tang et al. teaches a vent (326, 321a) allowing gases to escape during assembly of the packaged semiconductor to a printed circuit assemble [see figs. 1-2].

Regarding claims 10-11, Tang et al. teaches a vent (321a) in a side of the package lid.

Regarding claim 12, Tang et al. teaches a vertical wall (V1) around a top (322) of the package lid (32) [see fig. 2, attached above].

Regarding claim 13, Tang et al. teaches fiducial marks (consider protrusion P1 or 325) formed in the rim (V1) [see fig. 2, attached above].



Regarding claim 14, Tang et al. teaches fiducial marks (325a) formed in corners of a rectangular package lead (32) [see fig. 1].

Regarding claim 15, Tang et al. teaches a package lid that is substantially rectangular [see fig. 1].

Regarding claim 19, Tang et al. teaches a first molding compound (consider the molding compound 33 formed on the sloped wall (321) located on the left side of the structure as shown in figure 2). and a second molding compound (consider the molding compound 33 formed on the sloped wall (321) located on the right side of the structure as shown in figure 2).

Regarding claim 21, Tang et al. teaches a solder ball grid array (305) [see fig. 2].

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

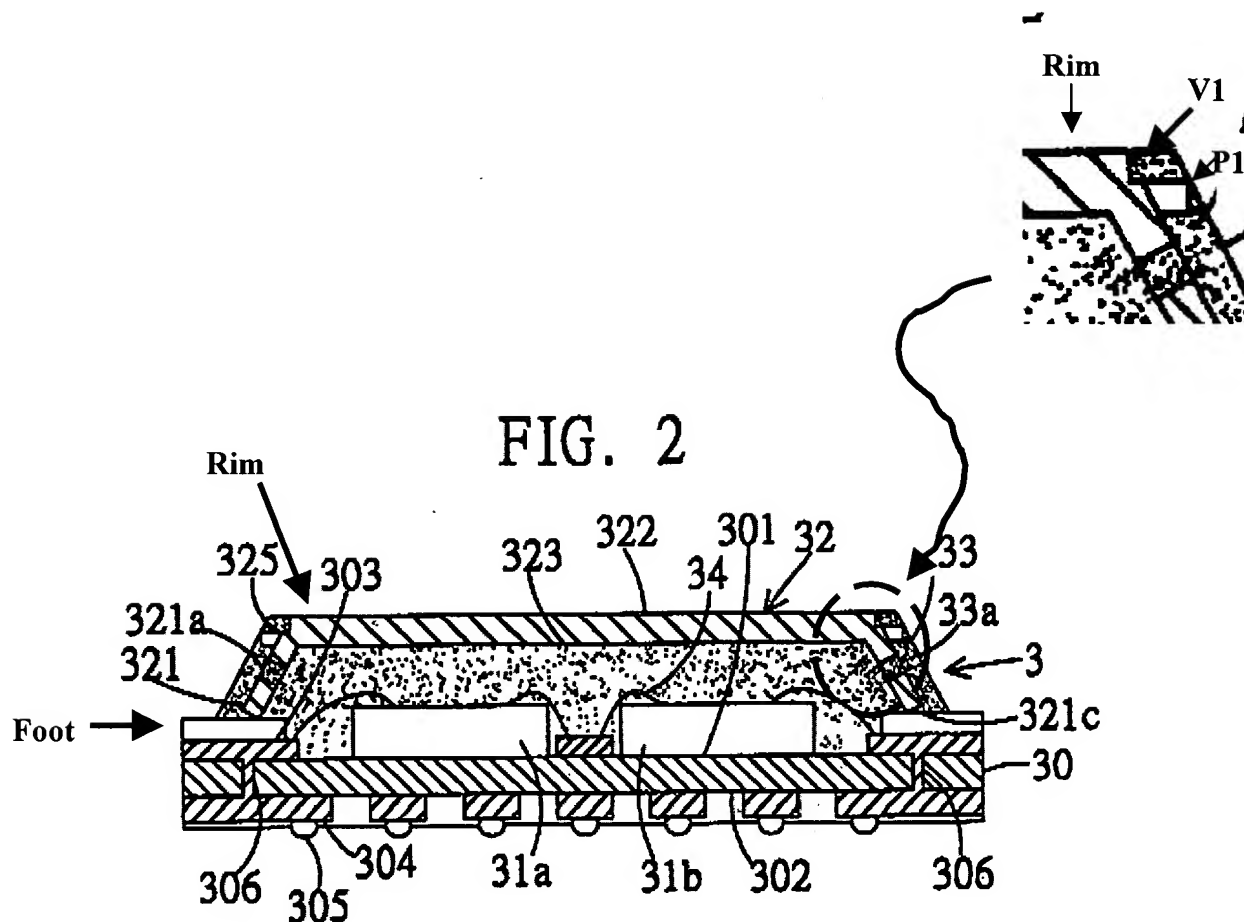
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. As far as understood, claims 2, 6, 11-14, 16, and 17 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Fishley et al. (US Pat. No. 6,654,248 B1) in view of Tang et al. (US Pat. No. 6,246,115 B1).

Regarding claim 11, Fishley et al. fails to teach a gap in the sloped wall. However, Tang et al. teaches the claimed limitation in figure 2. For instance, Figure 2 shows a gap (321a) in the sloped wall (321) of the package lid (32).

Fishley et al. and Tang et al. are analogous art because they are from the same field of endeavor as applicant's invention. At the time of the invention it would have been obvious to a person of ordinary skill in the art to include a gap in the sloped wall of the package lid taught by Fishley et al. The motivation for doing so, as is taught by Tang et al., is to enforce the bonding between the package lid and the encapsulant (col. 5, lines 7-8). Therefore, it would have been obvious to combine Tang et al. with Fishley et al. to obtain the invention of claims 11-14.

Regarding claim 2, Fishley et al. teach a sloped wall (11) which appears to be inclined at an angle of less than  $90^{\circ}$  [see fig. 3]. However, Fishley et al. fails to explicitly teach an angle of between  $30^{\circ}$  and  $60^{\circ}$ . Tang et al. appears to show a sloped wall (321) of about  $45^{\circ}$  [see fig. 2]. Thus, it would have been obvious to one of ordinary skill in the art to include a sloped wall having an angle of between  $30^{\circ}$  and  $60^{\circ}$ , since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Huang*, 40 USPQ2d 1685,1688(Fed. Cir. 1996) citing *In re Aller*, 105 USPQ 233., 235 (CCPA 1955).



Regarding claim 12, Tang et al. teaches a vertical wall (V1) around a top (322) of the package lid (32) [see fig. 2, attached above].

Regarding claim 13, Tang et al. teaches fiducial marks (consider protrusion P1 or 325) formed in the rim (V1) [see fig. 2, attached above].

Regarding claim 14, Tang et al. teaches fiducial marks (325a) formed in corners of a rectangular package lead (32) [see fig. 1].

Regarding claims 6, 16 and 17, it is considered that these claims are *prima facie* obvious without showing that the claimed ranges achieve unexpected results relative to

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the prior art range. In re Woodruff, 16 USPQ2d 1935, 1937 (Fed. Cir. 1990). See also In re Huang, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996) (claimed ranges of a result effective variable, which do not overlap the prior art ranges, are unpatentable unless they produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art). See also In re Boesch, 205 USPQ 215 (CCPA) (discovery of optimum value of result effective variable in known process is ordinarily within skill of art) and In re Aller, 105 USPQ 233 (CCPA 1955) (selection of optimum ranges within prior art general conditions is obvious).

11. Claims 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fishley et al. (US Pat. No. 6,654,248 B1) in view of Yang et al. (US Pat. No. 6,433,420 B1).

Regarding claims 18 and 20, Fishley et al. teaches the exposed perimeter portion (40) of the package substrate (14) in figure 3. However, Fishley et al. fails to teach a package substrate comprising polymer material or an organic resin.

Yang et al. teaches that it is well known in the art to form the package substrate (10) of a polymer material or an organic resin [col. 4, lines 9-11].

Fishley et al. and Yang et al. are analogous art because they are from the same field of endeavor as applicant's invention. At the time of the invention it would have been obvious to a person of ordinary skill in the art to form the package substrate taught by Fishley et al. of a polymer material or an organic resin. The motivation for doing so, as is taught by Yang et al., is to enhance the bonding between the package lid and the

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encapsulant. Therefore, it would have been obvious to combine Yang et al. with Fishley et al. to obtain the invention of claims 18 and 20.

### ***Allowable Subject Matter***

12. Claim 32 is allowed.

13. Claim 31 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

### ***Response to Arguments***

14. Applicant's arguments filed June 4, 2007 have been fully considered but they are not persuasive. With regards to claim 1, the "configure to" clause and the term "when" as recited in claim 1 do not limit the claim to a particular structure as argued. In fact, the use of the "configured to" clause and the term "when" in claim 1 merely suggest or make optional the limitations subsequently recited in the claim. See MPEP 2111.04. Thus, the rejection is considered to be proper since the structure as recited in claim 1 only requires a package lid having a sloped wall, which is taught by the cited prior art.

### ***Conclusion***

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

### ***Correspondence***

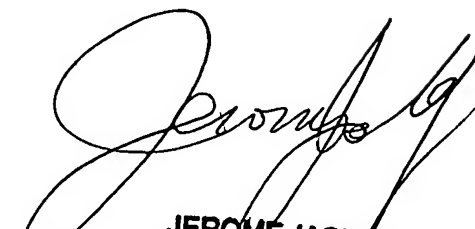
Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R. Díaz whose telephone number is (571) 272-1727. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

José R. Díaz  
Examiner  
Art Unit 2815



**JEROME JACKSON**  
**PRIMARY EXAMINER**

Disapproved by  
Examiner  
5/10/07

X-1574 US  
Replacement Sheet

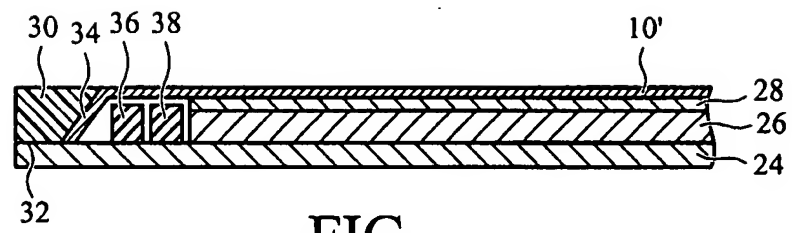


FIG.  
2A

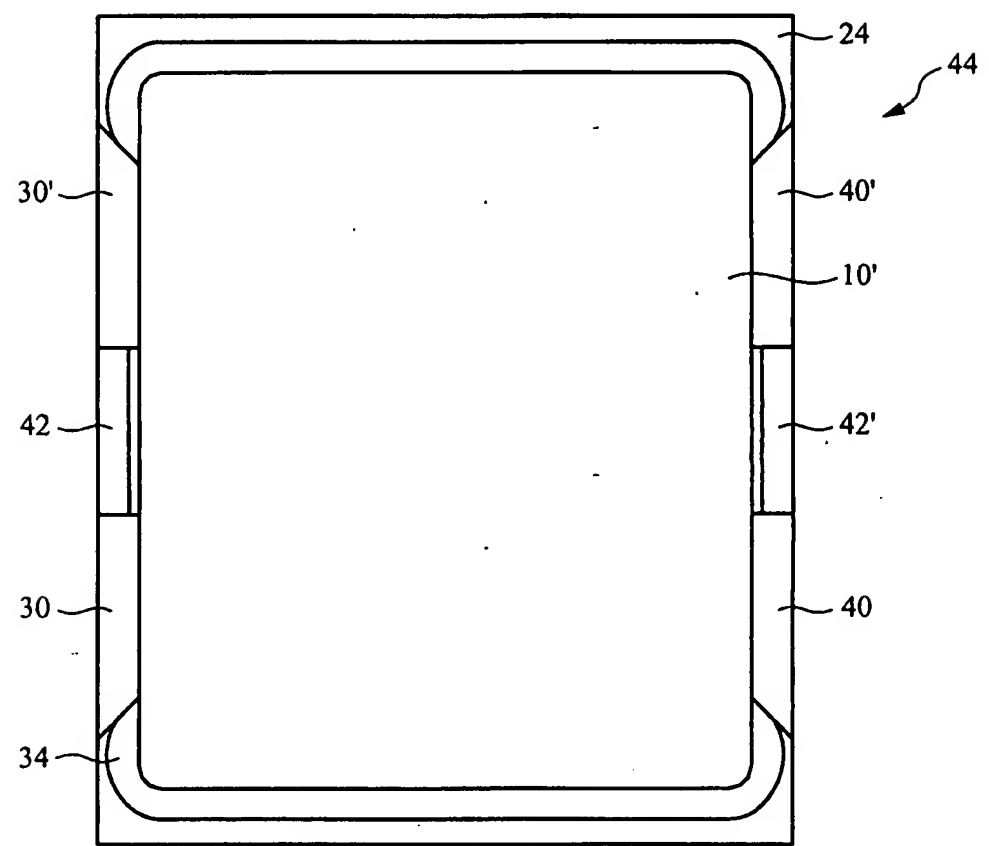


FIG.  
2B

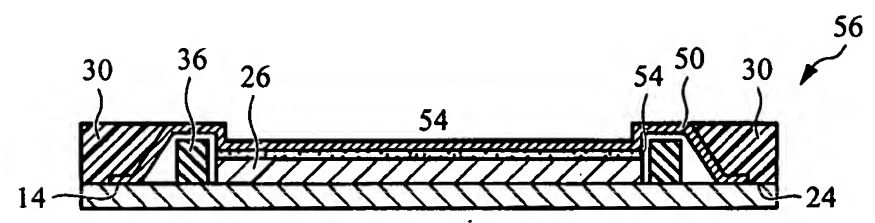


FIG.  
2C